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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/593,275	06/13/2000	Upendra V. Chaudhari	YOR-2000-0168US1	7772
35195	7590	04/17/2006	EXAMINER	
FERENCE & ASSOCIATES 409 BROAD STREET PITTSBURGH, PA 15143			HAN, QI	
			ART UNIT	PAPER NUMBER
			2626	
DATE MAILED: 04/17/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/593,275	CHAUDHARI ET AL.	
	Examiner	Art Unit	
	Qi Han	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Response to Amendment

3. This communication is responsive to the applicant's amendment and RCE examination both filed on 02/27/2006. The applicant(s) amended claims 1, 14 and 27 (see the amendment: pages 2-9).

The examiner withdraws the rejection of claims 13 and 26 under 35 USC 112 2nd, because the applicant's arguments further clarifies the rejected subject matter (see pages 12-14 of the amendment after final filed on 08/25/2005).

Response to Arguments

4. Applicant's arguments filed on 02/27/2006 with respect to claims 1-27 have been fully considered but are moot in view of the new ground(s) of rejection. It is noted that even the amended independent claims introduce new matter and/or change the scope of the claims, the previous cited prior art is still applicable to the claim rejection for this office action (see detail below).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding independent claims 1, 14 and 27, the amended limitation “the model being resolved hierarchi(c)ally into **at least one frame** comprising a plurality of levels of phonetic detail of varying resolution for **each frame**” is vague, because the terms of “at least one frame (meaning not each frame)” and “each frame” appear to conflict with each other in the context, so as being indefinite.

Regarding the rest of the claims, the rejection is based on the same reason described for claims 1, 14 and 27, because these dependent claims inherit all limitations of their parent claim(s).

Claim Rejections - 35 USC § 103

7. Claims 1-3, 6-12, 14-16, 19-25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldenthal et al. (US 6,205,424) hereinafter referenced as Goldenthal, in view of Newman et al. (US 5,946,654) hereinafter referenced as Newman.

Regarding **claim 1**, as best understood in view of the claim rejection under 35 USC 112 2nd (see above), Goldenthal discloses two-staged cohort selection for speaker verification system (title), comprising:

“providing a model corresponding to a target speaker, the model being resolved [hierarchically] into at least one frame”, (column 3, line 64 to column 4, line 29, 'the frames...processed by a model generator to produce sets of acoustic models which characterize the original speech signals', 'one set of acoustic models for every identified speaker (target speaker) desiring enrollment');

“receiving an identity claim”, (column 1, lines 47-49, 'the claimed identity of an individual can be verified by having the individual utter a prompted sequence of words or spontaneous speech during a testing session');

“ascertaining whether the identity claim corresponds to the target speaker model”, (column 1, lines 56-57, 'if the score exceed a predetermined threshold its presumed that the individual is who he or she claims to be');

“said ascertaining step comprising the steps of: determining, for each frame [and each level] of phonetic detail of the target speaker model, a likelihood value; and resolving the at least one likelihood value to obtain a likelihood score”, (column 1, lines 50-57, 'these validation or testing speech signals are analyzed and compared with the pre-stored observation models

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corresponding to the "claimed" identity to determine scores', 'the scores can be expressed as log likelihood scores: $\text{score} = \log p(O/I)$, where p represents the likelihood that the observed frames O were produced by the individual I).

But, Goldenthal fails to expressly disclose the model being resolved "hierarchically", the frame "comprising a plurality of levels of phonetic detail of varying resolution for each frame", and determining a likelihood value for "each level" of the phonetic detail of target speaker model. However, these features are well known in the art as evidenced by Newman who, in the same field of endeavor, discloses speaker identification using unsupervised speech models (title), comprising that that 'each word 700 (Fig. 7) is represented by a set of phonemes 705 that represent the phonetic spelling of the word', and 'each phoneme is represented by three sets of model parameters 710 that correspond to the three nodes of the phoneme' (the model hierarchically resolved) (column 6, lines 29-34), and 'comparing each frame of the sequence of frames to model parameters from retrieved model for the phoneme node' (col. 6, line 66 to col. 7, line 2), which suggests that the system includes multiple levels of phonetic detail and the corresponding processing for each level (the model hierarchically resolved), as claimed. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Goldenthal by specifically providing multiple phonetic detail levels and the corresponding processing for the model hierarchically resolved, as taught by Newman, for the purpose (motivation) of increasing efficiency and quality of a recognition system.

Regarding **claim 2** (depending on claim 1), Goldenthal in view of Newman further discloses "for each frame and each level of phonetic detail likelihood value is a maximum

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likelihood value” (Goldenthal: column 1, lines 53-54, 'the a log likelihood score'; column 2, lines 21-31, the log likelihood 'function f can be statistical ... maximum').

Regarding **claim 3** (depending on claim 2), Goldenthal in view of Newman further discloses “said step of resolving the at least one likelihood value comprises averaging the at least one likelihood value”, (Goldenthal: column 1, lines 53-54, 'the a log likelihood score'; column 2, lines 21-31, the log likelihood 'function f can be statistical ... average').

Regarding **claim 6** (depending on claim 1), Goldenthal in view of Newman further discloses “the at least one level of phonetic detail comprises at least one of the following: a global level; a phonemic level and a subphonemic level”, (Goldenthal: column 4, lines 8-29, 'a segment based speech approach to speech processing' and 'that designated segment can be units of speech, for example, phones, or transition from one phone to another').

Regarding **claim 7** (depending on claim 6), as stated above (see claim 1), Goldenthal in view of Newman discloses “the at least one level of phonetic detail comprises all of the following three levels: a global level; a phonemic level and a sub-phonemic level” (Newman: column 6, lines 29-34, 'each word 700 (Fig. 7) is represented by a set of phonemes 705 that represent the phonetic spelling of the word, and each phoneme is represented by three sets of model parameters 710 that correspond to the three nodes of the phoneme', which reads on the claim).

Regarding **claim 8** (depending on claim 7), Goldenthal fails to expressly disclose “providing labeling information for each frame.” However, the feature is well known in the art as evidenced by Newman who further discloses the labeling information in Figs 5-6 and 8. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention

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was made to modify Goldenthal by specifically providing labeling information for each frame, as taught by Newman, for the purpose of increasing efficiency of a recognition system.

Regarding **claim 9** (depending on claim 1), Goldenthal in view of Newman further discloses “accepting or rejecting the identity claim”, (Goldenthal: column 1, lines 50-57, 'if the scores exceed a predetermined threshold, it is presumed that the individual is who he or she claims to be'; Newman: column 2, line 44, 'Bayesian adaptation approach'; which necessarily includes accepting or rejecting the identity claim).

Regarding **claim 10** (depending on claim 1), as stated above, Goldenthal in view of Newman discloses “comparing a quantity based on the likelihood score to a predetermined threshold value”, (Goldenthal: column 1, lines 50-57, 'if the scores exceed a predetermined threshold, it is presumed that the individual is who he or she claims to be').

Regarding **claim 11**(depending on claim 10), Goldenthal in view of Newman further discloses “the steps of providing at least one model corresponding to at least one background speaker; and determining the quantity based on the likelihood score via employing the at least one background speaker model”, (Goldenthal: column 4, lines 49-58, 'a plurality of sets of "cohort" models (CM) 170 (Fig. 1) which characterize the speech signals of each identified speaker, are selected from the available sets of acoustic models of the other speakers', 'the selection can be made according to predetermined selection criteria, for example, the models which best characterize the speech of the identified speaker, or the models whose characterization fits some predetermined probability density function', which suggests that the combined system has capability of implementing the functionality as claimed).

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Regarding **claim 12**, (depending on claim 11), Goldenthal in view of Newman further discloses "said step of determining the quantity based on the likelihood comprises determining a log-likelihood ratio based on the likelihood score", (Goldenthal: column 2, lines 21-28, 'that during testing, the score obtained from the models of the speaker whose identity is claimed is compared with all of the scores derived from the small set of cohort models to produce a set of score differences, and the differences are then used as a normalized score = $\log p(O/I) - f[\log p(O/(C_k(I))]$, where $\log p(O/(C_k(I))$ are the scores for the k cohorts linked to the claimed individual').

Regarding **claims 14-16 and 19-25**, they recite an apparatus. The rejection is based on the same reason described for claims 1-3 and 6-12, respectively, because claims 14-16 and 19-25 recite same or similar limitation(s) as claims 1-3 and 6-12, respectively.

Regarding **claim 27**, it discloses a program storage device readable by machine, which corresponds to the method of claim 1. The rejection is based on the same reason described for claim 1 because the claim recites same or similar limitation(s) as claim 1.

Conclusion

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Effective January 14, 2005, except correspondence for Maintenance Fee payments, Deposit Account Replenishments (see 1.25(c)(4)), and Licensing and Review (see 37 CFR 5.1(c) and 5.2(c)), please address correspondence to be delivered by other delivery services (Federal Express (Fed Ex), UPS, DHL, Laser, Action, Purolater, etc.) as follows:

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qi Han whose telephone numbers is (571) 272-7604. The examiner can normally be reached on Monday through Thursday from 9:00 a.m. to 7:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richmond Dorvil, can be reached on (571) 272-7602.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Inquiries regarding the status of submissions relating to an application or questions on the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at: ebc@uspto.gov. For general information about the PAIR system, see <http://pair-direct.uspto.gov>.

QH/qh
April 7, 2006


RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER